

DETAILED ACTION

Status of Claims

Claims 18-50 were previously rejected. Claims 18-20, 23-37 and 40-52 are currently pending. Among these 51 and 52 are new.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 18-51 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim language does not claim the subject matter in proper Markush terms. Furthermore the claim language also does not refer to the subject matter in the proper alternative terms as recited By the MPEP §2173.05(h). The recited language seems to be a combination of both techniques. For example, claim 18 recites "A method for generating at least one of process heat, electrical energy, or combination thereof...". To comply with the proper alternative language as prescribed by the MPEP, this may be changed to *A method for generating process heat, electrical energy or a combination thereof...*

Claims 18 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what the relative term "high proportion of hydrogen" encompasses.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 18-20, 23-30, 32-37, 40-46, 48-51 and 52 are rejected under 35

U.S.C. 103(a) as being unpatentable over Larson et al. “Combined Biomass and Black Liquor Gasifier/Gas turbine cogeneration at pulp and paper mills”

Translation of the ASME. July 1999, in view of Johnssen CA2200491.

In regards to claims 18, 19, 32 and 33, Larson teaches using biomass fuels such as bark and pulp residues in “biomass gasifier/gas turbine” systems. The gasification unit generates energy/heat. During the gasification hydrogen and carbon monoxide are produced (Page1 Para2) (Table1).

In regards to claims 27, 28 and 51, Larson teaches generating additional steam from biomass when steam derived from black liquor was insufficient (Pg1 Col2. line1).

In regards to claims 29 and 30, Larson teaches the use of biomass-gasifier/gas turbine combined cycle cogeneration systems for pulp and paper mills. Also taught is that such cogeneration systems are primarily designed to meet process steam needs. This would inherently suggest that heat and energy is provided to where it is needed.

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In regards to claims 34-36, and 48, Larson teaches a gasifier which uses biomass such as bark and pulp from paper mill to generate energy. During the gasification hydrogen and carbon monoxide are produced (Page1 Para2) (Table1).

In regards to claims 43 and 44, Larson teaches the use of an additional biomass boiler when the steam generated from black liquor is insufficient.

In regards to claims 45 and 46, Larson teaches utilizing biomass-gasifier/ gas turbine combined cycle cogeneration systems for pulp and paper mills. Also taught is that such cogeneration systems are primarily designed to meet process steam needs. This would suggest that the heat and energy is being provided to where it is needed.

Larson does not expressly state that the waste biomass was converted into methanol. It also doesn't it also does not expressly state utilizing any reformers or shift reactions were used to generate hydrogen gas from carbon monoxide.

In regards to claims 20, 23-26, and 49, Johnssen teaches a process for generating electrical energy from regenerative biomass. Johnssen discloses that it is known in the art to produce methanol from biomass and then convert the methanol, in a reformer, into a hydrogen and carbon monoxide containing gas (Disclosure section Pg2 Para2). The reference discloses that the crude gas from a reformer has equal parts hydrogen and carbon monoxide. However, when the amount of steam is increased, the hydrogen/carbon monoxide volumetric ratio increases to more than 3 (Disclosure Pg8 Para1). This would suggest that the carbon monoxide reacts with steam to produce hydrogen gas and carbon dioxide. Johnssen teaches that crude gas from a reformer is

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purified by enriching it with hydrogen. This is disclosed to be done by pressure swing adsorption. The selective oxidation of the gas containing carbon monoxide is also taught (Pg 13).

In regards to claims 37, 40-42, 50 and 52, Johnssen teaches the state of the art in which it is known to use a reformer which generates hydrogen and carbon monoxide from biomass derived methanol (Disclosure section Pg2 Para2). The reference also discloses that the crude gas from a reformer has equal parts hydrogen and carbon monoxide. However, when the amount of steam is increased, the hydrogen/carbon monoxide volumetric ratio increases to more than 3 (Disclosure Pg8 Para1). This would suggest that the carbon monoxide reacts with steam to produce hydrogen gas and carbon dioxide. Johnssen teaches that crude gas from a reformer is purified by enriching it with hydrogen. This is disclosed to be done by pressure swing adsorption. The selective oxidation of the gas containing carbon monoxide is also taught (Pg 13). The reference discloses using a reformer to produce hydrogen and carbon monoxide from a hydrocarbon source (Pg 2 Para 2).

At the time of invention it would have been obvious to one having an ordinary level of skill in the art to perform the invention of Larson and further adding the steps of Johnssen. The motivation of doing so would have been to utilize the calorific value of carbon monoxide and create a method/system which utilizes the energy content of the biomass to a greater content (Johnssen, disclosure section Pg3 para2). Further more it would also have been obvious to one having an ordinary skill in the art to use any reforming technique as it would lead to similar or predictable results.

Claims 31 and 47 rejected under 35 U.S.C. 103(a) as being unpatentable over Larson et al. "Combined Biomass and Black Liquor Gasifier/Gas turbine cogeneration at pulp and paper mills" Translation of the ASME. July 1999, in view of Johnssen CA2200491 as applied to claims 18-20, 23-30, 32-37, 40-46, 48-51 and 52 above, and further in view of Fujimura, EP1136542A1.

Larson in view of Johnssen teaches that utilization of hydrogen, produced from biomass, in a gasification step to generate energy. However, Larson in view of Johnssen does not expressly teach the use of hydrogen to generate energy by a fuel cell.

Fujimura teaches the use of a system for generating energy. In the invention of Fujimura combustible materials are gasified and the resulting gas is used in a fuel cell to generate electricity, while waste heat produced in the fuel cell is used as a heat source for the gasification (Col3 line15).

At the time of invention it would be obvious to use the hydrogen produced by the process of Larson in view of Johnssen in a fuel cell, as taught by Fujimura. One would be motivated to use a fuel cell to produce heat/energy because there is reasonable expectation of success as shown by Fujimura.

Response to Arguments

Applicant's arguments filed 06/14/2009 have been fully considered but they are not persuasive. The applicant argues that the reference of Johnssen does not teach a reforming step which produces hydrogen and carbon monoxide from a hydrocarbon.

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However, the reference does suggest using a reformer to convert methanol to hydrogen and carbon monoxide (Pg2 Para 2 and Pg 4 Para 2). The use of steam to promote reforming in the conversion step is also taught. This can be considered as steam reforming since steam is used in the reforming step. The process of Johnssen represents similar characteristics to that of an auto thermal reforming process.

The applicant further argues that the reference of Johnssen not teach the step of partial oxidation. However, the instant claims do not requires such a step and also encompass the use of either auto thermal reforming or vapor reforming.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SYED IQBAL whose telephone number is (571)270-

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5857. The examiner can normally be reached on Monday to Thursday 7:30am EST to 6:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman can be reached on 5712721358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Wayne Langel/
Primary Examiner, Art Unit 1793

/S. I./
Examiner, Art Unit 1793